

DETACHABLE CASE FOR AN ELECTRONIC ORGANIZER

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CROSS-REFERENCE TO RELATED APPLICATION

This application claims the benefit of commonly assigned U.S. Design Patent Application Serial No.

10 29/093,963, entitled "Detachable Case", filed on September 21, 1998, and which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

15 Field of the Invention

This invention relates generally to external protective covers for instruments appropriate for use with a touch-sensitive electronic screen ("touch-screen") and more particularly to a hard case assembly which may be used with 20 devices commonly known as personal digital assistants (PDA) or personal information managers (PIM).

Description of the Prior Art

Many electronic information devices, such as palmtop 25 organizers and computers, utilize touch-screens for input of information and commands. Entering information via the touch-screen is typically accomplished either by applying

pressure to specific locations on the touch-screen, or by "writing" (i.e., forming characters, words, or symbols) on the touch-screen. Commonly, a specially designed stylus is employed to enter information in either of the foregoing 5 manners.

These palmtop devices typically are designed for use in a user's hand and are of a small enough configuration to be carried on one's person in a pocket, or for easy mobility in a purse or briefcase. These personal information management 10 systems utilize the touch screens for information input, as well as displaying the input or output information thereon. Further, these personal organizers may also have pushbutton or touch button interfaces for user input, such as for on/off control, scroll up - scroll down control, change 15 function control, and so on. As these personal devices are designed for easy portability, it is desirable to provide an external case to house the unit, while allowing protection from dirt and grime, but more importantly for protecting the touch screen from being scratched. Further, an external 20 case can also protect from accidental depression of one or more of the control buttons which could inadvertently turn the unit on, thereby draining the battery, or inadvertently initiating an unwanted function, such as erasing an important message stored in the unit.

25 Prior art coverings have been provided, such as custom leather covers, which allow for protection of the case and from accidental keying of a function. However, leather

cases, being soft themselves, cannot always provide the desired protection. For instance, if the touch screen is to be protected, then the leather case must be a wrap around type, which is generally unacceptable when the leather case 5 must be opened for use of the device itself.

In addition, while many users of these personal management systems are right handed, many are left handed. Because right handed people comprise the majority of the population, most manufacturers design their products with 10 only right handed users in mind. Left handed people are left to adapt to a right handed operating unit, whatever it is. No prior art solution teaches the alternate use or construction of a personal information system for a right handed person, or, alternatively, a left handed person.

15 Other prior art references show a construction of a handheld computing device. U.S. Patent Des. 346,366 to Kim et al, issued April 26, 1994 discloses a combined pen and database computer. This design patent shows a top and bottom section pivotable about an end axis. U.S. Patent 20 Des. 360,195 to Kimbrough et al, issued July 11, 1995 discloses a handheld computing device. This design patent shows a top section that is pivotable about two longitudinal axes to wrap around the device in an operating mode. U.S. Patent Des. 362,865 to Komuta et al, issued October 3, 1995 25 discloses an electronic calculator. This design patent shows a top section and a bottom section pivotable about a longitudinal edge axis. U.S. Patent Des. 366,280 to

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Henderson, issued January 16, 1996 discloses a luminous drawing surface and night light. This design patent shows a top and bottom surface pivotable about hinges on one longitudinal edge thereof.

5 SUMMARY OF THE INVENTION

The present invention comprises a personal information system unit hardcase assembly. This assembly has a top assembly, a bottom assembly, both of which are pivotable around a longitudinal axis forming a hinge design. The top 10 and bottom assemblies are similar in shape and function to allow a personal information management electronic system unit to be mounted within the case either facing to the right or to the left as a user faces the hardcase assembly. Mounted on the hinge assembly is a central rail attachment, 15 which is pivotally mounted on the hinge assembly of the hardcase assembly. This central rail attachment extends most of the internal vertical dimension of the hardcase. The central rail attachment provides a means for removably attaching a personal management unit onto this rail 20 assembly.

BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the invention, as well as other features thereof, reference may be had to the following detailed description of the invention in 25 conjunction with the drawings wherein:

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Figure 1 is a perspective view showing the top, front, right side, and a portion of the left side of a detachable case, according to the present invention;

Figure 2 is a front elevation view of the detachable
5 case;

Figure 3 is a top plan view of the detachable case;

Figure 4 is a rear elevation view of the detachable
case;

Figure 5 is a left side elevation view of the
10 detachable case;

Figure 6 is a right side elevation view of the
detachable case;

Figure 7 is a bottom plan view of the detachable case;

Figure 8 is a perspective view of the detachable case
15 showing the detachable case opened approximately to three-
quarters of a fully opened position, with a central
attachment rail positioned approximately at 0 degrees from
normal or fully closed position;

Figure 9 is a perspective view of the detachable case
20 showing the detachable case in the fully opened position,
with a central attachment rail positioned approximately at 0
degrees from normal or fully closed position;

Figure 10 is a perspective view of the detachable case
showing the detachable case in the fully opened position and
25 showing the central attachment rail in the 90 degree
position;

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Figure 11 is a perspective view of the detachable case of Figure 1, showing the detachable case in the fully opened position and showing the central attachment rail in the fully opened position at 180 degrees;

5 Figure 12 is a perspective view of the detachable case
similar to Figure 11 but partly in phantom showing the
central attachment rail in the fully opened position; and

Figure 13 is a breakaway view of the detachable case showing all the major parts prior to assembly.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention relates to an input device combining touch-screen stylus and conventional writing instrument functions. The following description is presented to enable one of ordinary skill in the art to make and use the invention and is provided in the context of a patent application and its requirements. Various modifications to the preferred embodiment will be readily

20 apparent to those skilled in the art and the generic principles herein may be applied to other embodiments.

Thus, the present invention is not intended to be limited to the embodiment shown but is to be accorded the widest scope consistent with the principles and features described herein.

Figure 1 is a perspective view showing the top, front, right side, and a portion of the left side of a detachable

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case, according to the present invention. Seen in this figure is the detachable case 100. The detachable case 100 is made up of three major sections. Top cover assembly 102, bottom cover assembly 104, and the hinge assembly 101. The 5 hinge assembly 101 comprises top cover hinge sections 105a. That is, hinge sections 105a are part of the top cover assembly 102. The hinge assembly also comprises bottom hinge sections 105. That is, bottom hinge sections 105 are part of the bottom cover assembly 104. The remaining part of the 10 hinge, section 106, is actually part of the mounting rail, which will be seen more clearly in the drawings below. A user would grasp the unit 100 and rotate the top cover assembly 102 about the axis of the hinge assembly 101. The bottom hinge section 105 will allow the top cover assembly 15 102 to rotate about the axis of the hinge at least 180 degrees. This will allow the unit to rest completely and stabilized on a flat surface as a table or pull down tray, such as on an airplane seatback.

Figure 2 is a front view of the hardcase assembly 100 20 in accordance with the present invention. Similar reference numerals are used in this figure as those in Figure 1, and similar reference numerals will be used in the other drawings as seen below. Figure 2 shows the top cover assembly 102 in a closed configuration and facing the bottom 25 cover assembly 104. To the left of the figure is hinge assembly 101 about which the top cover assembly 102 and bottom cover assembly 104 covers rotate. Also seen in end

section in Figure 2 is hinge pin 108, which will be seen more clearly in conjunction with Figure 13 below.

Figure 3 is a top view of the hardcase assembly 100. This figure shows clearly the top cover assembly 102, as well as the hinge assembly 101 comprising components 105, 105a, and 106. The top cover assembly 102 is shown as exists in the copending design application upon which this application depends for the priority date set forth above. However, for the purposes of this utility application other external designs may be utilized and still be in accordance with the principles of the present invention.

Seen also in Figure 3 are detent bump 98a and detent groove 98b. Also seen are detent bump 96a and detent groove 96b. These detent bumps and grooves are used to provide rest positions for the mounting rail 130 and covers 102 and 104, as more fully described below.

Figure 4 is a rear elevation view of the hardcase assembly unit 100. Similar numerals for the same apparatus is used in this figure as well. Top cover assembly 102 and bottom cover assembly 104 are seen together in the unit's closed configuration. Hinge sections 105 and hinge pin 108 are also seen herein. Seen for the first time in this figure are cutouts 122 and 124. Cutout 122 is the oval shaped opening in the top cover assembly 102, and cutout 120 25 is the oval shaped opening in the bottom cover assembly 104. This oval shaped opening allows the personal information management unit removably mounted inside the hardcase 100 to

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communicate with the outside world while the case 100 is in a closed configuration. That is, item 124 would be visible through the oval opening 120, 122. The item 124 could be a plug or jack apparatus for plugging in power to the PIM
5 system inside. Or item 124 could be a printer connection or a modem connection so that the PIM unit could be printing or uploading or downloading from the Internet or other on-line service. Or the item 124 could be an opening for an infrared apparatus which would allow for two way wireless
10 communication with another electronic device, such as a personal computer with a similar infrared or other type wireless communication system, or any combination of these devices.

Figure 4 also includes openings 126, 127 molded
15 directly in the top cover assembly 102 and bottom cover assembly 104 covers. This opening reveals item 128, which usually allows for removing a stylus unit from the PIM stored within. While item 128 is referred to as a stylus,
any other item, which would fit in this description, would
20 be valid here, as well, such as a combination stylus and pen unit.

In Figure 4, the opening 120, 122 was described as an oval opening, but any shaped opening that would accomplish the tasks mentioned above, or other, would be appropriate.

25 Figure 5 is a left side elevation view of the hardcase assembly 100. This figure similarly shows the case assembly 100 in a closed configuration. Seen are top cover assembly

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102, bottom cover assembly 104, hinge sections 105a as part
of the upper cover assembly 102, hinge sections 105 as part
of the bottom cover assembly 104, and hinge section 106
which is part of the mounting rail, which will be seen more
5 clearly in figures that follow. Item 109 in this figure is
a flattened area on the cover to accommodate opening the
hardcase a full 180 degrees. Also seen are detent bumps 96a
and 94a and detent bumps 96a and 94a and detent grooves 96b
and 94b.

10 Figure 6 is a right elevation view of the hardcase
assembly 100. This figure also depicts the case in a closed
position. Seen here are top cover assembly 102 and bottom
cover assembly 104. Also molded into the top and bottom
covers is molded opening 132, 134. Through this opening can
15 be seen the mounting rail 30 which, in this figure is on the
far side of the figure, against the hinges, which cannot be
seen in this figure. If a PIM was mounted in the hardcase
100, the PIM would be visible in Figure 6, but the mounting
rail 130 would not.

20 Figure 7 is the bottom view of the hardcase assembly.
Seen in this figure are bottom cover assembly 104, top cover
hinge sections 105a, bottom hinge sections 105, and mounting
rail hinge section 106. While the bottom and top covers are
seen herein to be very similar, they do not have to be and
25 still come within the principles of the present invention.

Figure 8 is a perspective view of the hardcase assembly
only partially open, approximately open 75%, or 120 degrees.

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All the parts are now clearly visible, including the mounting rail 130. Top cover assembly 102 and bottom cover assembly 104 are shown in the open configuration. Top cover hinge sections 105a and bottom cover hinge sections 105 are
5 seen in this figure. Mounting rail 130 is shown lying adjacent to and parallel to the axis of the hinge sections 105 and 105a. Here also is the hinge section 106 that is actually a part of the mounting rail 130. Mounting rail 130 is pivotable about the axis of the hinges 105 and 105a.
10 between outer limits defined only by the covers 102 and 104. That is, since Figure 8 is only open about 75% of the total amount it could be open, the mounting rail 130 will only move its 75% movement, as well, between the outer movements defined by the covers.
15 Figure 8 also shows an inner top cover 102a. Inner top cover 102a includes cutouts or indents 140 formed in or machined out of the inner top cover 102a. Bottom or lower cover assembly 104 also includes an inner bottom cover 104a. If a PIM unit is mounted in the hardcase assembly 100 with
20 its operating surface (the touch screen or viewing screen) facing left in this figure, then inner top cover 102a would be mounted in the top cover assembly 102. The indents or cutouts formed or manufactured in the inner top cover 102a are to accommodate any buttons or touch points on the PIM
25 unit. These buttons or touch points need to remain unencumbered and not touching the top cover for fear of energizing the buttons by coming into contact with the inner

top cover 102a when it is moved into a closed position. With the PIM unit mounted in the hardcase assembly 100 facing to the left in Figure 8, then inner bottom cover 104a would be mounted in the bottom cover assembly 104.

- 5 When, however, the PIM unit is mounted in the hardcase assembly facing to the right in Figure 8, then the user would swap the inner top cover 102a with the inner bottom cover 104a, so that the inner cover with the indent or cutouts would now become the inner bottom cover unit.
- 10 Similarly, the inner bottom cover 104a would then become the inner top cover unit 102a. This is to accommodate the buttons or touch points to remain free from extraneous energization by ensuring that the buttons or touch points do not get activated by the hardcase covers when moved into the closed position.

15 Inner covers 102a and 104a can be snap mounted into the top and bottom cover assemblies in manners known in the art, such as by small tabs, or pressure fit, or by some adhesive. The adhesive would make for more of a permanent

- 20 configuration by the user. Having the indents or cutouts on the top cover or the bottom cover is to accommodate a right handed person or left handed person, or any personal choice by a right or left handed person.

25 Detent bump 98a and detent groove 98b are indicated in Figure 8, as well, on hinge section 106, which, as described herein, is part of mounting rail 130. There are actually three detent grooves 98b on mounting rail 130. These bump

and groove combinations are provided to allow mounting rail 130, and thus the PIM unit mounted on mounting rail 130 to have rest positions at 0 degrees, 90 degrees, and 180 degrees.

5 Detent bump 96a and detent groove 96b are also shown in Figure 8. Hinge section 105, as part of bottom cover assembly 104, includes detent bump 96a. Hinge section 105a, as part of top cover assembly 102, includes detent bump 96b. These bump and grooves provide rest positions for the top
10 and bottom cover assemblies 102 and 104 at 0 degrees, 120 degrees, and 180 degrees, in a similar manner as for the mounting rail 130 bump and grooves. There are actually three detent grooves 96b to allow for three rest positions. The bumps 96a and 98a are spring loaded (see Figure 13) to
15 force indent bumps 96a and 98a into indent grooves 96b and 98b.

While there are three each of grooves 96b and 98b, there could be more or less grooves to allow for more or less rest positions for the covers and mounting rail, within
20 the scope of the present invention.

Figure 9 shows the hardcase assembly in its fully open position. The parts of the assembly are similarly seen as compared with Figure 8. The attachment rail 130 is seen to be in its stowed position against the inner bottom cover
25 104a.

Figure 10 is similar to Figure 9. However, in this figure, mounting rail 130 is shown pivoted about the axis of

the hinge assembly 105, 105a, and equidistant between the upper 102 and lower 104 case covers.

Figure 11 is similar to Figure 9, as well. However, in this figure, mounting rail 130 is shown pivoted about the 5 axis of the hinge assembly 105, 105a, but now resting completely against the inner upper cover 102a.

Figure 12 shows a PIM unit mounted on the mounting rail 130, with the touch or viewing screen facing left as seen in this figure. It is mounted facing left so that the cutouts 10 or indents in the inner upper cover 102a will accommodate the buttons or touch points on the PIM itself. The cutouts or indents 140 are shown to comprise four circular and one stretched circular shape. These cutouts or indents 140 are schematically shown, as the hardcase inner cover 102a would 15 be manufactured with a cutout or indent configuration to match whichever commercial PIM it is desired to mount within the hardcase 100.

The PIM unit would be mounted in the hardcase 100 by slipping its stylus opening over the mounting rail 130. If 20 the PIM unit has stylus openings running longitudinally along each of the side edges of the unit, then the PIM can be mounted within the hardcase 100 either facing to the right or facing to the left. This, of course, depends on the desires of the user, and what may be comfortable to a 25 left handed person may also be comfortable to a right handed person. So no predetermined choice is inferred for either right or left-handers. It is to be understood, however, that

while the preferred embodiment allows for alternate internal placement facing left or right, it is still within the principles of the present invention if the PIM or PDA device is only mountable within the hardcase assembly 100 facing in
5 only predetermined direction.

Figure 15 is an assembly drawing for the hardcase assembly 100. Top skin 140 would be mounted onto the inner top case 142 in the manner set forth above, by adhesive or small insert tabs, etc. Bottom skin 148 would be similarly
10 mounted to inner bottom case cover 146 in a similar manner. Depending on whether the PIM is to face left or face right would determine which inner cover would be mounted to the top or bottom covers. Mounting rail 160 is seen in this figure and is similar to rail 130 as seen in the earlier
15 figures. Spring 162 and hinge pin 164 complete the assembly. For purposes of completeness, the compositions of the components of the assembly follow, but one skilled in the art could substitute other similar compositions within the scope of this invention. For example, the top 140 and
20 bottom 148 covers could be made of aluminum for lightness. Inner top cover 142 and inner bottom cover 146 could be made from ABS (acrylonitrile-butadiene-styrene). Similarly, the mounting rail could be made from ABS, as well. The spring 162 would normally be made from steel, and the hinge pin 164
25 could be made from stainless steel. The spring 162 would be used to bias the covers together to keep them from opening

accidentally, or to keep the covers from loosely flopping open and shut, or both.

In assembling the hardcase assembly 100, the inner top cover 142 would be mounted to the top cover 140 by the methods set forth above. The inner bottom cover 146 would be mounted to the bottom cover 148 by the methods set forth earlier. The spring would be inserted into one of the bottom hinge sections 105. Then the mounting rail would be inserted into the bottom cover unit 146, 148. After the hinge sections 105, 105a, and 106 are aligned, then the hinge pin 164 would be inserted through all the hinge sections and the spring to complete the hardcase assembly.

Throughout this application, references to PIM units were made. One such PIM or electronic organizer is the PALM III unit manufactured and sold by the Palm Computing Company, a 3COM Company, 1565 Charleston Road, Mountain View, CA 94043, USA. While each hardcase unit 100 would probably be custom made for each particular PIM or electronic organizer, no limitation of the invention should be inferred in the event one hardcase manufactured would fit another PIM or electronic organizer.

While the invention has been described with reference to specific embodiments, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted for elements thereof without departing from the true spirit and scope of the invention. In addition, modifications may be made without departing

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from the essential teachings of the invention.

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